Keeping an eye on retinoblastoma control of human embryonic stem cells.

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Public Summary:

Scientific Abstract:
Human embryonic stem cells (hESCs) hold great promise in regenerative medicine. However, before the full potential of these cells is achieved, major basic biological questions need to be addressed. In particular, there are still gaps in our knowledge of the molecular mechanisms underlying the derivation of hESCs from blastocysts, the regulation of the undifferentiated, pluripotent state, and the control of differentiation into specific lineages. Furthermore, we still do not fully understand the tumorigenic potential of hESCs, limiting their use in regenerative medicine. The RB pathway is a key signaling module that controls cellular proliferation, cell survival, chromatin structure, and cellular differentiation in mammalian cells. Members of the RB pathway are important regulators of hESC biology and manipulation of the activity of this pathway may provide novel means to control the fate of hESCs. Here we review what is known about the expression and function of members of the RB pathway in hESCs and discuss areas of interest in this field.